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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
FINK, BRIEANN R	
ART UNIT	**PAPER NUMBER**
1763	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/586,781	JACOBSEN ET AL.	
	Examiner	Art Unit	
	Brieann R. Fink	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 December 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *12-18 and 20-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *12-18 and 20-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This office action follows a reply filed on December 13, 2010. Claims 12 and 20-21 have been amended. Claims 12-18 and 20-22 are currently pending and under examination.

2. All previous rejections are withdrawn, as applicants have amended to include specific catalysts. However, upon further consideration, a new ground(s) of rejection is proposed below.

3. The texts of those sections of Title 35 U.S. Code are not included in this section and can be found in a prior Office action.

Claim Rejections - 35 USC § 102

4. Claims 12-15 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by *DeChellis* (US 5,405,922).

> *DeChellis* discloses polymerizing olefins, preferably ethylene with an alpha-olefin comonomer having most preferably 5 to 10 carbon atoms, in the presence of a metallocene catalyst in a gas phase fluidized bed polymerization reactor operating in condensed mode (col. 3, ll. 7-15, ll. 27-33). *DeChellis* discloses the catalyst as being represented by the formula $[L]_mM[X]_n$, where L is a bulky ligand, specifically a cyclopentadienyl ligand, M is a transition metal, that of which is exemplified as zirconium, X is a leaving group and m and n are such that the total ligand valency corresponds to the transition metal valency (col. 4, ll. 1-14, Examples, col. 9-10). *DeChellis* further discloses the fluidized bed as

having a recycle stream separate from the fluidized bed, which is the reaction zone (col. 8, ll. 29-35). *DeChellis* discloses that the recycle stream is compressed and/or cooled to form a liquid phase and a gas phase, which are reintroduced into the reactor (col. 2, ll. 53-56). Further, *DeChellis* discloses maintaining at least a 5.6ºC temperature differential between the dew point temperature and the reactor temperature (col. 6, l. 66-col. 7, l. 3). *DeChellis* discloses that the reactor pressure is most preferably in the range of about 250-350 psig, which is the same as 1.7-2.4 MPa, and a temperature in the range of 73.9-85ºC (col. 8, ll. 44-60). This falls within the preferred reaction conditions of the instant invention (see instant specification, p. 3, ll. 22-23). *DeChellis* exemplifies polymerizing ethylene and octene, wherein the ratio of octene/ethylene is 0.0090 (Table 2 and 3, col. 11-12).

DeChellis fails to specifically disclose maintaining the partial pressure of the alpha-olefin at an amount to prevent condensation within the reactor; however, the amount of comonomer, reactor temperature and partial pressures in the reaction zone are clearly disclosed by *DeChellis* and the polymerization is also disclosed as being operated in "condensed mode". This is the same as the instant invention as described above. Therefore, the process of *DeChellis* inherently prevents condensation within the reactor, as required by the instant claim 12. This is further supported by the applicants' disclosure that "the level of condensation in the reactor…is controlled by the amount of comonomer and the

temperature and partial pressure in the reaction zone" (see arguments submitted May 26, 2009, page. 8).

As to claim 13, *DeCellis* discloses the partial pressure of ethylene as between 75-240 psig, which is the same as 0.5-1.6 MPa. (col. 6, ll. 14-20).

As to claims 14-15, *DeChellis* exemplifies the polymerization of ethylene and octene the ratio of octene/ethylene is 0.0090 (Table 2 and 3, col. 11-12).

As to claim 16, *DeCellis* discloses the alpha-olefins to include those having 5 to 10 carbon atoms (col. 3, ll. 33), wherein that having 10 carbon atoms is 1-decene.

As to claim 18, *DeChellis* discloses the process as continuous (col. 1, ll. 9-10).

Claim Rejections - 35 USC § 103

5. Claims 20 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over *DeChellis* (US 5,405,922), as applied above to claims 12-16 and 18, in view of *Nickias* (WO 93/08199).

DeChellis discloses the claimed method of instant claims 12-16 and 18, as described above and applied herein, teaching the metallocene catalysts as being represented in general as described above and claimed in instant claim 12, specifically listing other catalysts and catalyst systems to include those as disclosed by *Nickias,* WO 93/08199 (col. 4, ll. 64-67).

Nickias teaches the same catalysts as claimed in instant claim 20 (p. 4-5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have carried out the method of polymerization of *DeChellis* using the catalysts of *Nickias* as *DeChellis* specifically discloses these catalysts as being useful.

As to claim 22, *Nickias* teaches titanium as a most preferred metal (p. 5, l. 16).

6. Claims 21 is rejected under 103(a) as being unpatentable over *DeChellis* (US 5,405,922), as applied above to claims 12-16 and 18, in view of *Nickias* (WO 93/08199), as evidenced by *Wilson* (US 5,659,054), and further in view of *Devore* (US 5,470,993).

DeChellis discloses the claimed method of instant claims 12-16 and 18, as described above and applied herein, teaching the metallocene catalysts as being represented in general as described above and claimed in instant claim 12, specifically listing other catalysts and catalyst systems to include those as disclosed by *Nickias,* WO 93/08199 (col. 4, ll. 64-67).

Nickias exemplifies the catalyst as (N-t-butylamido)dimethyl(tetramethyl-η^5-cyclopentadienyl)silanetitanium dibenzyl (p. 11, Example 4), which as evidenced by *Wilson* is a titanium (+4) complex (col. 10, ll. 32-34), as are all of those disclosed by *Nickias*.

Devore teaches titanium and zirconium complexes which are the same as those claimed in instant claim 21 (col. 6, ll. 16-50). *Devore* teaches these complexes to possess improved catalytic properties when compared to

corresponding complexes wherein the metal in the +4 formal oxidation state, specifically that they retain high catalytic efficiency at elevated temperatures, give higher molecular weight polymers, are compatible with alkylaluminum compounds, and are more readily and efficiently activated by common activating cocatalysts, when compared to corresponding complexes wherein the metal in the +4 formal oxidation state.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have carried out the polymerization of *DeChellis* using the catalysts of *Devore* rather than titanium (+4) complexes of *Nickias* as *Devore* teaches these catalysts to have improved catalytic properties

Note the instant specification specifically discloses that “specific complexes suitable for use in the present invention are those disclosed in WO 95/00526, which is the same as US 5,470,993, *Devore.*

7. Claims 12-18, 20 and 22 rejected under 35 U.S.C. 103(a) as being unpatentable over *Agapiou* (US 7,244,795)

Agapiou teaches preparing a copolymer of ethylene, where the comonomer is an alpha-olefin having 4-14 carbon atoms, specifically listing 1-octene and 1-decene, in a continuous gas phase polymerization carried out in a fluid bed process having a reactor and a recycling stream, wherein the recycling comprises gaseous monomer and a diluent.

Agapiou teaches the catalysts to include a variety of catalysts, most of which fall within the claimed formula, specifically those of formula (Va-ii), which are the same as those of instant claims 20 and 22 (col. 4-15).

Agapiou teaches the reactor temperature as 30-150ºC and a pressure of 250-350 psig (col. 23, ll. 5-7 and col. 24, ll. 34-40), which is the same as 1.7-2.4 MPa, which are the same conditions as those desired by the instant invention (see instant specification, p. 3, ll. 18-21).

Agapiou fails to explicitly teach that the gas phase polymerization is operated in "condensed mode", as required by instant claim 12, however, applicants define "condensed mode" as "...the process of purposefully introducing a recycle stream having a liquid and a gas phase into the reactor ..." (see instant specification, p. 2, ll. 23-31). *Agapiou* meets this definition and therefore operates in "condensed mode".

As to claims 14-17, *Agapiou* teaches the copolymerization of ethylene with an α-olefin comonomer having 4 to 14 carbons, specifically listing octene-1 and decene-1 as comonomers, and that of which are copolymerized in a mole ratio of comonomer to ethylene of from 0.0005 to 1.0 (col. 23, ll. 40-50). This ratio is equivalent to the partial pressure ratio of comonomer to ethylene, which can be shown when applied to the ideal gas law (pV = nRT). This range overlaps the claimed range of claims 15 and 17, and it has been held that overlapping ranges are sufficient to establish *prima facie* obviousness. See MPEP 2144.05.

Agapiou fails to specifically teach that the amount of α-olefin is maintained at a level at which to “prevent condensation” in the reactor; however, the amount of comonomer and temperature and partial pressures in the reaction zone are clearly taught by *Agapiou* and the polymerization is operated in "condensed mode”, as described above.

Therefore, the process of *Agapiou* is inherently carried out such to "prevent condensation", as required by the instant claim 12. This is further supported by the applicants' disclosure that "the level of condensation in the reactor…is controlled by the amount of comonomer and the temperature and partial pressure in the reaction zone” (see arguments submitted May 26, 2009, page. 8 and instant specification, p. 3, ll. 7-9).

Response to Arguments

8. Applicant's arguments with respect to the instant invention have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brieann R. Fink whose telephone number is (571)270-7344. The examiner can normally be reached on Monday through Friday, 7:00 AM to 4:30 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Milton I. Cano can be reached on (571)272-1398. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Milton I. Cano/
Supervisory Patent Examiner, Art Unit 1763

/Brieann R Fink/
Examiner, Art Unit 1763